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STUDIES IN THE GENUS HEVEA III

BY

Richard Evans Schultes[1]

ON THE USE OF THE NAME HEVEA BRASILIENSIS

For some time, it has been believed by certain authorities that *Hevea brasiliensis*, the name long used to denote the well known cultivated rubber tree, is untenable if the International Rules of Botanical Nomenclature be strictly interpreted.

Several botanists have written on the complicated problem which underlies this presumed untenability, treating it from differing points of view and with diverging conclusions. This divergency of opinion has led to uncertainty amongst taxonomists not only concerning the actual status of the name *Hevea brasiliensis*, but also as to the authorities to whom it should be attributed.

In 1858, Baillon (Etude Euphorb. (1858) 326) pointed out that the name *Siphonia brasiliensis* HBK. had been applied apparently to two distinct plants: one from the Orinoco and one from the lower Amazon. He proposed to reserve *Siphonia brasiliensis* for the latter—which is our cultivated species—and published a new name (*Siphonia Kunthiana* Baill.) for the former.

Later, in 1900, Warburg (Kautschukpflanzen (1900)

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26) discussed this same problem and resolved, in accordance with what appeared to him to be priority, to keep the name *Hevea brasiliensis* for the Orinoco species and to give the cultivated plant an entirely new name (*Hevea Sieberi* Warb.).

Shortly thereafter, Huber (in Bull. Soc. Bot. France 49, ser. 2 (1902) 43) thought it a better policy to conserve *Hevea brasiliensis* for the cultivated species, and he actually made the proposal that it be so conserved. In 1905, Ule studied the circumstances and also concluded (in Engler Bot. Jahrb. 35 (1905) 664) that the name *Hevea brasiliensis* should be kept for the Brazilian species and *Hevea Kunthiana* used for the concept represented by the Venezuelan collections.

In reviewing the problem recently, Burkill (Dict. Econ. Prod. Malay Penins. 1 (1935) 1159), stated that: "It would lead to much confusion were botanists at this date to displace the . . . . name [*Hevea brasiliensis*], on the ground that *Siphonia brasiliensis* Kunth is not the plant which everyone now calls *Hevea brasiliensis;* yet, if the rules of nomenclature are followed strictly, that, it seems, should happen."

In 1936, Chevalier (in Rev. Bot. Appl. Agric. Trop. 16 (1936) 620) published a most complete review of the historical aspects of the problem. Basing his opinions on a study of the literature, combined with an examination of authentic collections preserved in Paris, he came to the conclusion that the valid name for the cultivated species of *Hevea* is *H. brasiliensis.* In his own words, his conclusion is: "Celle [the collection] du Pará [as opposed to the Orinoco material] doit garder le nom de *Hevea brasiliensis* (Willd.) Muell.-Arg. (excl. syn. H.B.K.)."

Although Chevalier intimated that Willdenow's *Siphonia brasiliensis* had been validly published to denote what we today call *Hevea brasiliensis*, he did not enter into a discussion of the reason why it was so according to the Rules and why the name cannot, under any circumstances, be applied to the Orinoco material. In spite of the fact that Chevalier's paper constitutes the most important contribution of the century towards a clarification of this question, it has apparently not received the attention it deserves. Baldwin (in Journ. Hered. 38 (1947) 54; ibid. 40 (1949) 47) accepted Chevalier's conclusions, but other investigators who have recently published on *Hevea* (Schultes in Bot. Mus. Leafl. Harvard Univ. 12 (1945) 7; Seibert in Ann. Missouri Bot. Gard. 34 (1947) 305), by using "(HBK.) Muell.-Arg." as authorities for the binomial *Hevea brasiliensis*, have indicated acceptance of the long-established belief that Kunth's publication of *Siphonia brasiliensis* was the earliest.

Cook, in 1941, went much farther than all who had previously discussed this problem. He proposed (in Journ. Wash. Acad. Sci. 31 (1941) 46) to substitute the new name *Siphonia Ridleyana* Cook for our cultivated rubber tree. He rejected the generic epithet *Hevea* on the basis of faulty reasoning and an erroneous understanding of the meaning of the term *homonym*. Even were a new name needed, Cook's substitute specific epithet would be superfluous in view of Warburg's *Hevea Sieberi* of 1900. Cook did not mention Warburg's work in his rather extensive discussion, nor did he indicate by citation or by context that he was familiar with Chevalier's convincing article.

To help end the continued uncertainty in regard to the name of such an important economic plant, and to reiterate Chevalier's conclusion and connect the reasons for it with the corresponding authorizing Article of the International Rules of Botanical Nomenclature, I shall restate the pertinent historical facts and present as complete a synonymy as possible.

In 1800, Humboldt collected material of *Hevea* along the Río Tuamini near Javita and also along the Río Orinoco at San Fernando de Atabapo, both localities in the upper Orinoco basin of southern Venezuela. These collections were described by Kunth in 1825 under the name *Siphonia brasiliensis.* This has been taken almost unanimously as the first valid publication of the binomial.

In the first decade of the nineteenth century, Count Hoffmannsegg received, presumably from the traveller-collector F. G. Sieber, who worked in Pará from 1801 to 1807, specimens of *Hevea* which he turned over to Willdenow for study. There is strong reason to believe that this material came from the lowermost course of the Río Amazonas. Willdenow annotated the material with the name "*Siphonia brasiliensis* Willd." and deposited it in his herbarium which was preserved at Berlin-Dahlem. These specimens represent the concept which we have come to know as *Hevea brasiliensis.*

When Kunth published the name *Siphonia brasiliensis,* he described the two Venezuelan collections and cited them as the only basis for the description. He did not cite the Brazilian material of Sieber, but he did include in synonymy "*Siphonia brasiliensis* Willd. herb." with the following footnote: "In specimine brasiliensi a Willdenoicum cel. Beauvois communicato (inque Museo Lessertiano asservato) foliola multo minora, subtus pallide viridia (nec albida)." Also in synonymy, he included "Siphoniae species brasiliensis Adr. de Juss. Euphorb. p. 40" and "S. foliolis oblongis, acuminatis. Willd. mss." Willdenow had the habit of making such abbreviated descriptions on herbarium sheets or on envelopes containing specimens, and it is entirely probable that Kunth, who visited the Willdenow herbarium in Berlin, had copied this himself, for it seems not to have been published elsewhere.

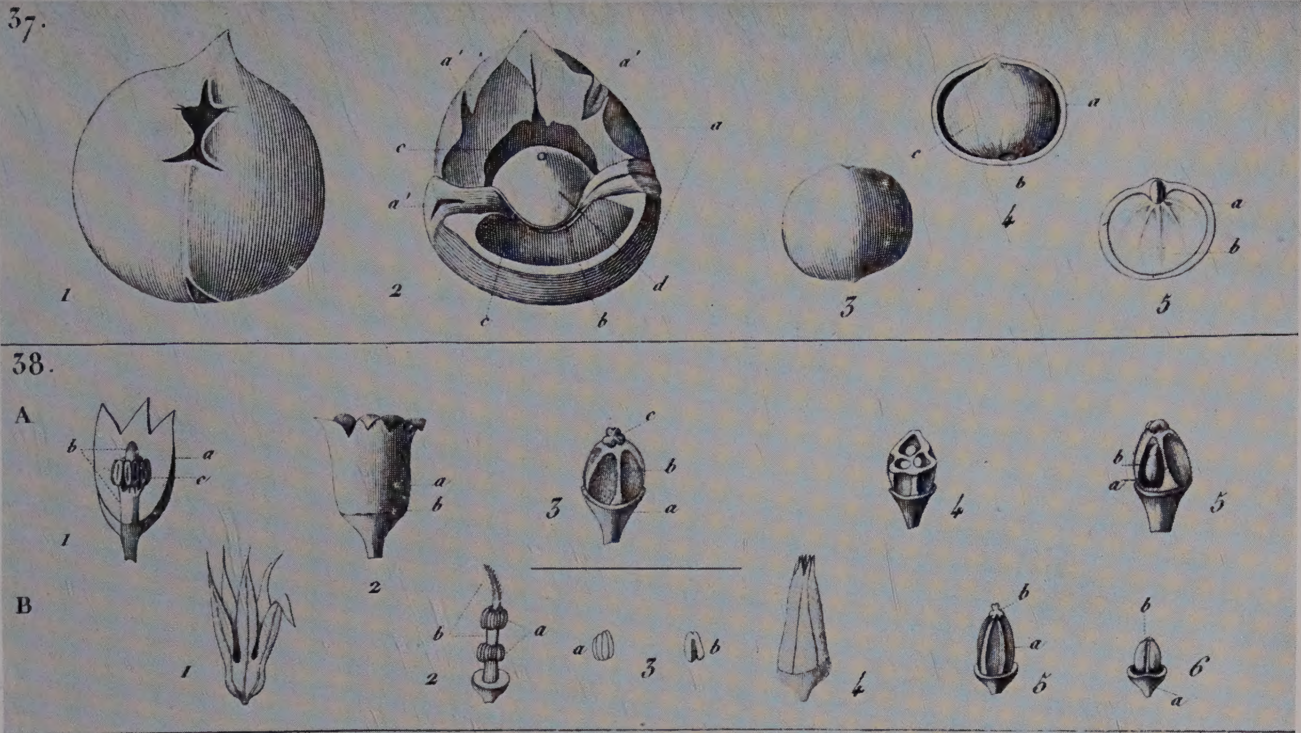
It is quite apparent from a thorough study of the Kunth publication of *Siphonia brasiliensis* that, although he pointed out in the footnote reproduced above that the Brazilian material differed in several characters from the two Venezuelan collections, Kunth himself considered the three collections to represent the same concept. The description, it is also apparent, was based upon the Venezuelan material which, as we now know, definitely does not represent the common cultivated plant but rather a rare species which has, as yet, acquired no commercial importance.

A critical examination of Kunth's treatment discloses an inconspicuous point which seems to have been overlooked and which alters our interpretation of the problem. In their "Nova genera et species plantarum," Humboldt, Bonpland and Kunth were accustomed to indicate names which they were publishing as their own for the first time with a small dagger. In the preface (loc. cit. 1 (1816) vi), they state: "Species et genera nova signo † indicantur." *Siphonia brasiliensis* is *not* marked with a dagger. This, coupled with their citation in synonymy of Willdenow's *Siphonia brasiliensis* (which had been written on an herbarium sheet) would seem to indicate that Kunth was publishing an unpublished Willdenow name. This puzzling situation is completely clarified if, remembering the lack of the dagger in Kunth's publication, we refer to an article by Adr. de Jussieu. It then becomes apparent that Jussieu *validly* published Willdenow's *Siphonia brasiliensis* in 1824, one year before the appearance of Kunth's description. In his "De Euphorbiacearum generibus. . . ." (1824) tab. 12, fig. 38b, 1–6, Jussieu published a plate consisting of diagnostic drawings of the staminate calyx, the stamens with

EXPLANATION OF THE ILLUSTRATION

Plate XVIII. The earliest publication of the name *Siphonia brasiliensis* in Adr. de Jussieu's "De Euphorbiacearum generibus. . . ." (1824) t. 12, fig. 38b, 1-6.

PLATE XVIII



A.D.J. del.t

Plée père sculp.t

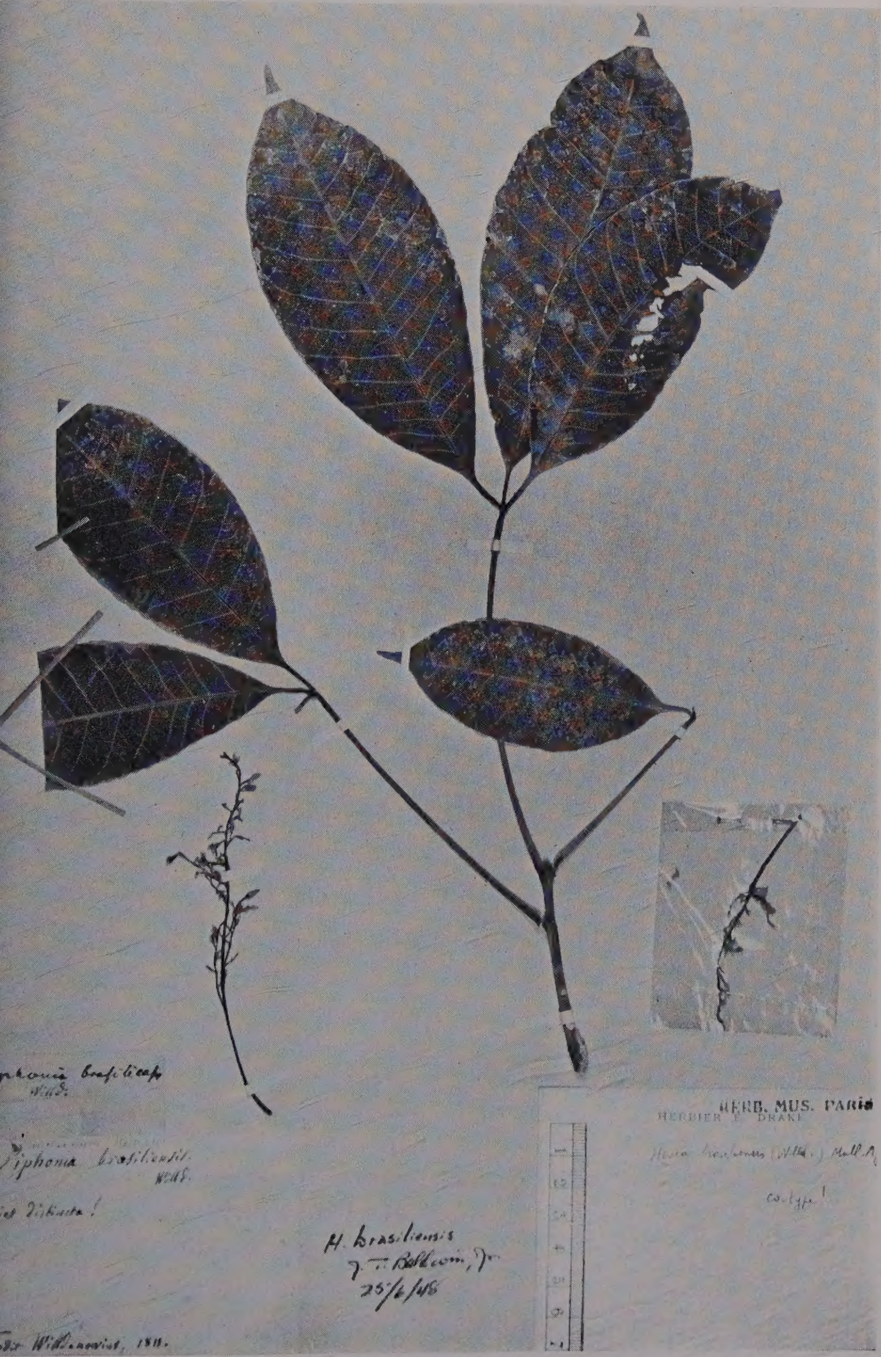
36. *ALEURITES ambinux*. 37. *ANDA gomesii*.

38. A. *SIPHONIA elastica*. B. *S. brasiliensis*.

EXPLANATION OF THE ILLUSTRATION

PLATE XIX. A specimen of the type collection of *Hevea brasiliensis* preserved in the Paris Herbarium.

PLATE XIX


phonia brasiliensis
Willd.
iphonia brasiliensis.
Willd.
ist distincta!
Willdenowii, 1811.
H. brasiliensis
J. T. Baldwin, Jr.
25/6/48
HERB. MUS. PARIS
HERBIER E. DRAKE
Hevea brasiliensis (Willd.) Müll. A
cotype!

the anthers and suprastaminal column, the pistillate flower, the pistil and the ovary of "*Siphonia brasiliensis* W. (in herbariis)." In accordance with Article 44 of the Rules, this constitutes valid publication, for the name of a species is validly published if it be accompanied "by a plate or figure with analyses showing essential characters; but this applies only to plates or figures published before January 1, 1908."

When Mueller transferred the specific epithet from *Siphonia* to *Hevea* in 1865, he was probably unaware of the discrepancy between the Orinoco and the Amazon collections—and this in spite of Baillon's insistence on that point in 1858. In making the new combination, Mueller based it on "*Siphonia brasiliensis* Kunth in Humb. et Bonpl. Nov. Gen. et Spec. 7, p. 171" and cited "*S. Kunthiana* Baill." as a synonym. It is significant, however, that the Brazilian material ("In Brasilia paraënsi, Hoffmansegg in hb. Willd. fol. 17936. p. 1") was cited before the Venezuelan collections. It is because the author of this combination, apparently unaware of Jussieu's paper, attributed the earliest publication to Kunth that the author citation of *Hevea brasiliensis* has been erroneously written as "(HBK.) Mueller-Argoviensis" by almost all taxonomists.

In summary, we may say that the proper and valid name of the cultivated rubber tree is

Hevea brasiliensis (*Willd. ex Adr. de Juss.*) *Mueller-Argoviensis* in Linnaea 34 (1865) 204.

Its synonymy is as follows:

Siphonia brasiliensis Willdenow ex Adr. de Jussieu Euphorb. Gen. (1824) t. 12, pl. 38b., fig. 1–6. *Non Siphonia brasiliensis* HBK. Nov. Gen. et Sp. 7 (1825) 171.

Hevea janeirensis Mueller-Argoviensis in Martius Fl. Bras. 11, pt. 2 (1874) 706.

Hevea Sieberi Warburg Kautschukpf. (1900) 32, fig.

Hevea Randiana Huber in Bol. Mus. Goeldi 4 (1906) 636.

Hevea brasiliensis var. *stylosa* Huber (loc. cit. 4 (1906) 640.

Hevea brasiliensis var. *janeirensis* (Muell.-Arg.) Pax in Pflanzenr. 4 (1910) 121.

Hevea brasiliensis var. *Randiana* (Huber) Pax loc. cit. 4 (1910) 123.

Hevea brasiliensis mut. *Granthami* Bartlett in Bot. Gaz. 84 (1927) 200.

Hevea Granthami Bartlett loc. cit. 84 (1927) 200, *nomen alt. anteriori.*

Hevea brasiliensis forma *typica* Ducke in Arch. Jard. Bot. Rio Janeiro 6 (1933) 55.

Hevea brasiliensis var. *subconcolor* Ducke loc. cit. 6 (1933) 55.

Hevea brasiliensis forma *subconcolor* Ducke in Arch. Inst. Biol. Veg. Rio Janeiro 2 (1935) 224.

Hevea brasiliensis forma *Randiana* (Huber) Ducke loc. cit. 2 (1935) 224.

Siphonia Ridleyana Cook in Journ. Wash. Acad. Sci. 31 (1941) 46.

Siphonia janeirensis (Muell.-Arg.) Cook loc. cit. 31 (1941) 61.

The varietal names which follow, included by Seibert (loc. cit. 305–306) as synonyms of *Hevea brasiliensis,* are here omitted pending additional studies which may possibly indicate that they are distinct concepts.

Hevea brasiliensis var. *angustifolia* Ule in Tropenpflanz. Beiheft. 6 (1905) 8.

Hevea brasiliensis var. *latifolia* Ule loc. cit. 6 (1905) 8.

Hevea brasiliensis var. *acreana* Ule in Engler Bot. Jahrb. 50 (1914) 14.

For his friendly counsel in this as in many other problems which have arisen in my botanical research, I am deeply grateful to the late Mr. Charles A. Weatherby of the Gray Herbarium of Harvard University.

THE IDENTITY OF UCUQUÍ

BY

João Murça Pires[1] and Richard Evans Schultes[2]

One of the results of recent field work in the upper Rio Negro basin of Brazil has been the identification of a useful plant of that area—the *ucuquí.* The fruit of this tree has an edible and delicious mesocarp and is an important part of the diet of the native peoples of the region.

Investigation has shown that the *ucuquí* is an undescribed species of the sapotaceous genus *Pouteria.* It is altogether fitting that, in publishing a description of this food plant, we employ as a specific epithet the common name which refers exclusively to this species over the greater part of its range.

Pouteria Ucuqui is immediately set apart from all other species of the genus by the excessively developed disk which surrounds the ovary.

Pouteria Ucuqui *Pires & Schultes sp. nov.*

Arbor enormis, usque ad centum viginti pedes alta, radicibus tabularibus, trunco columnari usque ad tres pedes in diametro, cortice crasso, molli, extus atrobadio

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et intus sanguineo cum latice albo aquosoque. Ramuli juniores, inflorescentiae, petioli et foliorum nervi indumento ferrugineo-pulverulento vel ferrugineo-furfuraceo obtecti. Folia alterna, bene coriacea, elliptica, basi et apice acuta vel obtusiuscula, plerumque cum acumine 7–10 mm. longo, margine integra, 11–20 cm. longa, 5.5–10 cm. lata, supra nitidula, subtus opaca (statu bene juvenili ferruginea), minutissime ferrugineo-pilosula; costa leviter striata, supra prominens, subtus valde elevata et robusta; nervi secundarii utrinque octo ad quindecim, supra leviter insculpti, subtus valdissime prominentes; venulae superficie utraque paulo impressae. Petiolus elongatus, siccitate striatus et leviter rugosus, saepissime 3.5–5.5 cm. longus, 2–3 mm. in diametro. Inflorescentiae axillares, valdissime congestae, fasciculatae. Flores mordaciter fragrantes, flavo-virides, gemmationis statu longe persistentes sed flores ipsi fugaces. Sepala quinque, imbricata, subrotundata, plerumque 2 mm. longa, utrinque minutissime adpresso-pilosa, intus demum glabrescentia. Petala quinque, per $\frac{1}{2}$ vel $\frac{2}{3}$ longitudinis partem connata, imbricata, oblonga, apice acutiuscula vel obtusa, margine integra, plerumque 3 mm. longa, 1 mm. lata, extus pilosiuscula sed demum glabrescentia, intus subglabra, tubo vulgo 0.5–1 mm. longo. Stamina quinque, petalis opposita, filamentis vix 1 mm. longis; antherae apice acutae, basi rotundatae, connectivo mediano crasso, loculis duobus, sublinearibus, rimis oppositis, dehiscentibus. Staminodia petalis alterna, apice acuta, 1 mm. longa vel minora, aliquando inconspicua. Ovarium biloculare, minutissimum, pilosum, disco valde hispido, circiter 0.5 mm. alto circumdatum; stylus circiter 1.2 mm. longus, pilosus vel glabrescens, cum stigmatibus inconspicuis. Fructus maximus, 9–13 cm. longus, 5–7 cm. in diametro, monospermus; semen magnum, plerumque 7–10 cm. longum, 3.5 cm. latum, 3 cm. in di-

ametro, cum testa crustacea, nitida, plusminusve 2 mm. crassa, area umbilicali magna.

Arbor a regionis typicae brasiliensis incolis *ucuquí* (in lingua nheenagtú), *puch-pee-á* (in lingua tukanorum tribus); a regionis colombianae incolis *oó-le-da* (in lingua kuripakanorum tribus), *ka-he-pa* (in lingua mirañorum tribus) appellatur.

Collections examined:

Brazil: Estado do Amazonas, Upper Rio Negro, Igarapé Uabá, opposite mouth of Rio Xié. "Immense tree, 110 feet tall, with wide-spreading crown. Large buttress roots up to 6 feet. Tree columnar, 2½ to 3 feet in diameter. Bark dark brown, shaggy externally, red internally, soft, ½–¾ inch thick. Latex sparse, white. Wood of medium hardness, compact, white. Flowers in extremely dense clusters, falling easily. Sepals greenish; petals white; anthers brown, apparently odourless. Common name: *ucuquí*." January 5, 1948, *Richard Evans Schultes & Francisco López 9553* (Type in Herb. Gray; Duplicate types in Herb. Inst. Agron. Norte (Belém do Pará); U.S. Nat. Herb.; Kew; Econ. Herb. Oakes Ames).—Rio Issana basin, between Rio Aiarí and Rio Caiarí (Uaupés), near Serra Tunuí. "Arvore 25 m. × 40 cm. Frutos estimados como alimento indígena. *Ucuquí*." October 13, 1945, *Ricardo de Lemos Fróes 21388*.—Rio Negro, near Uaupés (Sao Gabriel), Serra de Uanarí "*Ucuquí*. Arvore muito grande. Latex branco, pegajoso, página inferior da folha revestida por leve indumento escamoso ferrugineo, fruto amarelado." October 26, 1947, *João Murça Pires 773*.—Same locality. "*Ucuquí*. Arvore muito grande. Latex branco, pegajoso, página inferior da folha revestida por leve indumento escamoso ferrugineo; fruto amarelo." October 30, 1947, *João Murça Pires 799*.—Same locality. "*Ucuquí*. Arvore muito grande no alto da serra. Floras quasi brancas (botões)." November 17, 1947, *João Murça Pires 1165*.—Rio Negro, near confluence with Rio Uaupés. "*Ucuquí*. Arvore muito grande. Madeira dura. Latex branco, pegajoso. Pagina inferior da folha revestida por leve indumento escamoso, ferrugineo, amarelado." November 5, 1947, *João Murça Pires 833*.—Rio Uaupés, Serra Uapicí. "*Ucuquí*. Arvore grande." November 17, 1947, *João Murça Pires 1150*.—Rio Negro, near Uaupés (Sao Gabriel). "*Ucuquí*. Arvore platinhas novas, colhidas sob a arvore." October 30, 1947, *João Murça Pires 792*.—Rio Uaupés, Ipanoré "*Puh-piá*. Arvore grande." November 15, 1947, *João Murça Pires 1057*.—Rio Uaupés, Taracuá.

"*Ucuquí*, (lingua geral). *Puh-piá* (Tukano), November 8, 1947, *João Murça Pires 905.*—Rio Uaupés, Serra Uapicí. "*Ucuquí*. Arvore grande." November 17, 1947, *João Murça Pires 1149.*—Rio Negro, Sao Gabriel. "*Coquí*. Enormous tree. Buds brownish. Fruit edible." November 20–25 1947, *Richard Evans Schultes & Francisco López 9184.*—Rio Negro, Sao Gabriel. "*Ucuquí*. Enormous tree." January 14, 1948, *Richard Evans Schultes & Francisco López 9618.*—Middle Rio Negro basin, Rio Curicuriarí. "Ucuquí." *Richard Evans Schultes & Francisco López 9710.*—Rio Negro, Ipanoré. Caatinga forest beyond town. "*Coquí*. Enormous tree. Fruit edible." November14–15, 1947, *Richard Evans Schultes & João Murça Pires 9096.*

Colombia: Comisaría del Vaupés, Río Negro, opposite Piedra del Cocuy. "Enormous buttressed tree, 110 feet tall, diameter 3 feet. Flowers greenish yellow. Bark shaggy, brown. Fruit edible." December 28, 1947, *Richard Evans Schultes & Francisco López 9484.*—Río Guainía, near Sejál. "Tree 100 feet tall, buttressed. Kuripaka name: *oó-le-da*." June 1948, *Richard Evans Schultes & Francisco López 10058a.*—Comisaría del Amazonas, Río Caquetá, near La Pedrera. "Enormous tree. Fruit edible. Miraña name: *ká-hĕ-pa*." July 15, 1948, *Richard Evans Schultes & Francisco López 10215.*

Venezuela: Territorio del Amazonas, Río Negro, base of Piedra del Cocuy. "Enormous tree 120 feet tall, 2½ feet in diameter, slightly buttressed. Bark brown, shaggy, soft, scarlet within. Latex sparse, white. Buds greenish yellow." December 24, 1947, *Richard Evans Schultes & Francisco López 9458.*

Pouteria Ucuqui is very common in the northwesternmost part of the Brazilian State of Amazonas along the upper Rio Negro, from Tapurucuara (Santa Isabel) upstream, and along its affluents: the Uaupés, Issana, Tikié, Curicuriarí, Dimití, and probably many others. It is known to occur in Colombia in the Ríos Guainía (constituting the source of the Río Negro) and on the Río Caquetá. It has also been found on the Japurá in Brazilian territory and has been reported from the Río Solimões (Le Cointe, P. "Arvores e plantas uteis" (1934) 457). According to reliable reports, it occurs in certain places far into Venezuelan territory along the lower course of the Río Guainía and on the Casiquiare itself.

In this entire area, the plant—an enormous, heavily crowned tree which fruits profusely once a year—is found in abundance in the virgin forest on high, well drained soil. It is also often encountered in a state of apparent cultivation, since, in clearing for house sites, the tree has been spared. When completely ripe, the thick, fleshy mesocarp of the fruit, which resembles that of the avocado (*Persea americana* Mill.) to a striking degree, is very palatable. When green, however, it is full of latex and is extremely sticky.

Pouteria Ucuqui is known in the entire Brazilian part of its range by the name *ucuquí*, a word originating from the Lingua Geral or Nheengatú language which is spoken widely in the State of Amazonas, and especially in the Rio Negro. The Tukano Indians of the Rio Uaupés refer to the tree as *puch-pee-á* (the *ch* being soft as in the German *ich*). In Colombia, the native name for *Pouteria Ucuqui* amongst the Kuripaka Indians of the Río Guainía is *oó-le-da;* and amongst the Mirañas of the Río Caquetá (La Pedrera), *ká-he-pa*. The tree is called *yucú* by the Spanish-speaking population of the Venezuelan town of San Carlos on the uppermost Río Negro.

The term *ucuquí*, so far as we have been able to ascertain, refers exclusively to *Pouteria Ucuqui* and should not be confused with *ucuquirana* (i.e., "false *ucuquí*"), a name widely applied in the same area to the sapotaceous *Ecclinusa sanguinolenta* Pierre (*E. Balata* Ducke)—also called *abiurana*—a tree which is actively exploited as the source of a type of balata. The two trees are completely distinct from all points of view.

Pouteria Ucuqui is a very tall and robust tree, usually with comparatively large buttresses at the base; the lowest branches are at a great height from the ground. These conditions make the study and collection of herbarium material rather difficult, especially since the flowers, which are borne on the branchlets, are very minute and cannot be seen from the ground, even with binoculars.

Dr. Adolpho Ducke, who has visited the upper Rio Negro basin several times, was unable to collect flowering material of *ucuquí*, although he devoted special attention to this tree which he believed represented an undescribed species. Without flowering material, however, there was some question as to even its generic affinities.

When we began our work in the upper Rio Negro in late 1947, Dr. Ducke counseled us to try to find flowering material which would settle definitively the identity of *ucuquí*. With this in mind, we studied a number of individuals over a wide area. It was almost always necessary to use the balatero's climbing-irons (employed during the extraction of balata from species of *Manilkara*), since the girth of the tree usually prevented the use of the "peconha" (a band of pounded bark which the Indians place on the feet to aid them in climbing). The expertness of our assistant, the late Francisco López, in the use of the climbing-irons greatly increased the number of trees which we could study.

During October and November, this work was carried on principally by Murça Pires. At first, sterile specimens only were obtainable. Then, gradually, we began to secure material which was in bud. No flowers, however, were found, and we later learned that the species develops the flower with extreme slowness, persisting in bud sometimes for three or four months. Many experiments were tried to force the buds to open: sun, artificial heat, soaking in hot and warm water; but all these efforts failed.

It is interesting in this connexion to note how little the natives know about the life-history of this species, even though it is one of their common and useful plants. Repeated questioning on our part brought forth the most divergent and amusing remarks concerning the flowering of *ucuquí*. Many, when asked during what month the tree flowers, replied that they had never seen it flower and that, therefore, it did not flower. Others insisted that the tree blooms during the night and immediately drops all the flowers. This second "explanation" is, in a way, ingenious, because, as we later witnessed, the forest floor under an *ucuquí* tree, where there had even the day previously been no indication of blossoms, would suddenly be covered with literally hundreds of thousands of flowers or parts of flowers. Our studies showed that, in spite of the very long period of aestivation, the flowers are almost ephemerous in *Pouteria Ucuqui.*

During the last few months of 1947, Murça Pires revisited trees in bud several times in an attempt to collect fertile specimens. When he returned to Belém, Schultes and López continued the search. In late December, it was noted that the buds on a number of trees previously examined were swelling rapidly, in spite of the fact that for at least a month previous there had been no appreciable alteration in their size.

On January 5, we found our first flowering tree. It was very early in the day, about six o'clock in the morning, when our attention was called to the tree by the patter of falling flowers. Upon climbing the tree, we noted a very strong aromatic and pungent odor. It is significant to note that the buds never had a fragrance. There were innumerable large bees and several other kinds of smaller insects visiting the flowers even at this early hour. Later, we encountered other trees in flower, but the pronounced odor was not noted. It is possible that the strong, aromatic fragrance is given off only for a short period during the very limited blossoming time. As accurately as we could calculate, open flowers persist for no longer than three days on an individual tree and usually are much shorter lived.

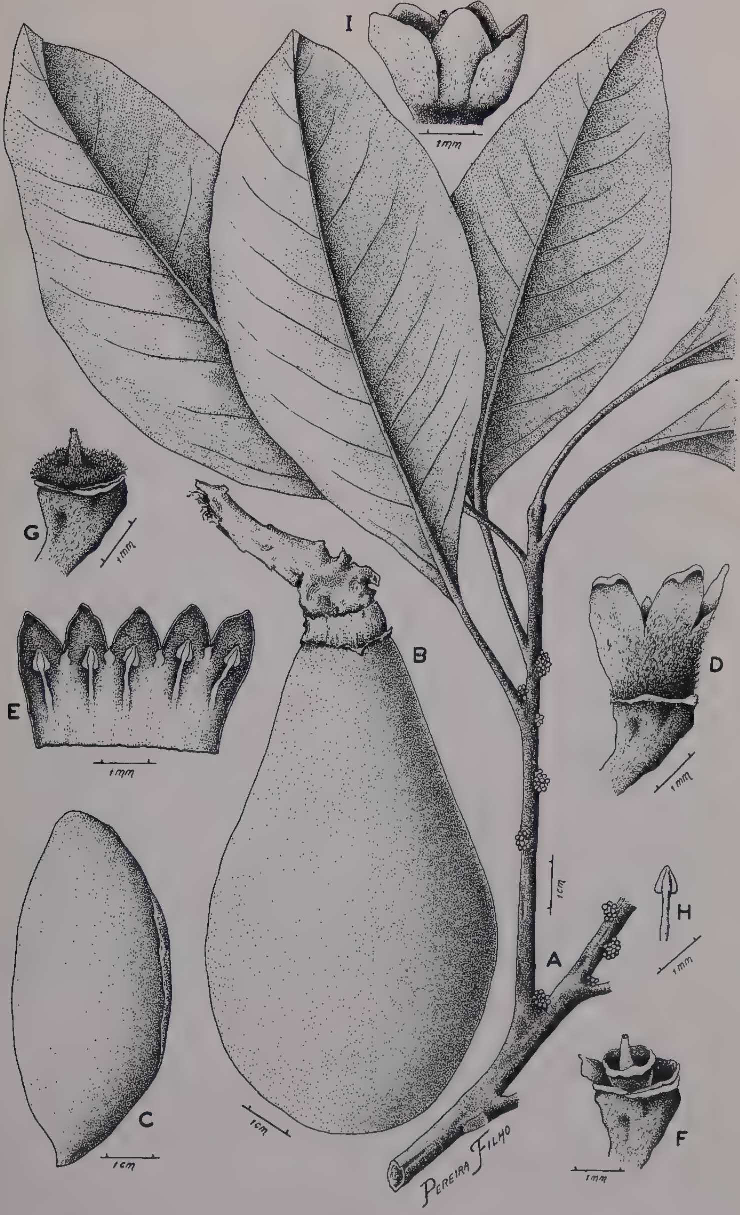
EXPLANATION OF THE ILLUSTRATION

Plate XX. Pouteria Ucuqui *Pires & Schultes.* A, flowering branch, about one half natural size. B, fruit. C, seed. D, flower. E, dissection and view of interior of corolla. F, dissection of flower showing disk around ovary. G, dissection of flower showing pilosity around ovary. H, anther. Each drawing has a millimeter scale to indicate magnification.

Drawn by Pereira Filho
of Instituto Agronômico do Norte

Plate XX

POUTERIA *Ucuqui* Pires & Schultes

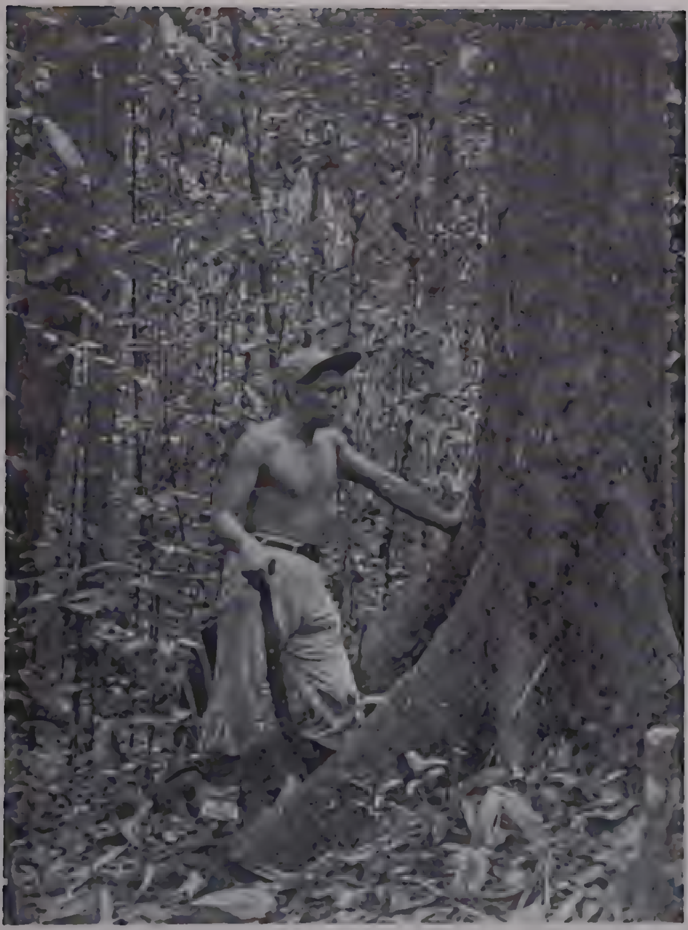


EXPLANATION OF THE ILLUSTRATION

Plate XXI. Pouteria Ucuqui *Pires & Schultes.* Basal portion of trunk of type tree, showing the buttress roots.

Photograph by R. E. Schultes

Plate XXI



EXPLANATION OF THE ILLUSTRATION

PLATE XXII. POUTERIA UCUQUI *Pires & Schultes.* Inflorescences from branchlets of type tree.

Photograph by R. E. SCHULTES

PLATE XXII

EXPLANATION OF THE ILLUSTRATION

Plate XXIII. Pouteria Ucuqui *Pires & Schultes.* Flowers from type tree.

Photograph by R. E. Schultes

PLATE XXIII

A century set (i.e. one hundred herbarium specimens) was collected from the type tree for distribution by the Gray Herbarium of Harvard University. Floral material was also obtained from the same tree and preserved in alcohol and glycerine for use in drawing up the description.

An interesting Indian use of *ucuquí*, discovered by Fróes along the Rio Japurá, is the manufacture of toy whistles from the seeds. All of the interior of the seed (the cotyledons) is removed and a number of holes, over which the fingers are placed, are made. In popular medicine in Amazonian Brazil, the fruit is sometimes employed as a vermifuge (Le Cointe loc. cit.).

The earliest and, in fact, the only reference of an extended nature to *ucuquí* which has come to our attention is Wallace's interesting discussion of the plant (Wallace, A. R. "A narrative of travels on the Amazon and Rio Negro" ed. G. T. Bettany (1889) 243–244). Because of its historical significance, we quote it in full. "Of a passing Indian [on the Rio Uaupés] I bought a basket of Ocokí, and some fish. The Ocokí is a large pear-shaped fruit, with a hard thick outer skin of almost woody texture, then a small quantity of very sweet pulpy matter, and within a large black oval stone. The pulp is very luscious, but is so acrid as to make the mouth and throat sore, if more than two or three are eaten. When, however, the juice is boiled it loses this property; and when made into mingau with tapioca, is exceedingly palatable and very highly esteemed in the Upper Rio Negro, where it is abundant. It takes at least a peck of fruit to give one small panella of mingau.

"On the next day, the 10th in the afternoon, the Indians all suddenly sprang like otters into the water, swam to the shore, and disappeared in the forest. 'Ocokí' was the answer to my inquiries as to the cause of their sudden disappearance; and I soon found they had discovered an ocokí-tree, and were loading themselves with the fruit to satisfy the cravings of hunger, for the Indian's throat and mouth seem invulnerable to all those scarifying substances which act upon civilised man. The tree is one of the loftiest in the forest, but the fruit falls as soon as ripe, and its hard woody coating preserves it from injury. Baskets, shirts, trousers, etc,, were soon filled with the fruit and emptied into the canoe; and I made each of the Indians bring a small basketful for me; so that we had 'mingau de ocokí' for three succeeding mornings."

THE CORRECT NAME OF THE YAUPON

BY

Richard Evans Schultes[1]

During a recent conversation with me regarding the nomenclature of the yaupon, Professor Oakes Ames called my attention to a precious remark which Dillenius once wrote in a letter to Linnaeus (Smith, J. E.: "A selection of the correspondence of Linnaeus and other naturalists" 2 (1821) 96). "We all know the nomenclature of Botany to be an Augean stable, which C. Hoffman, and even Gesner, were unable to cleanse." Nothing could be more expressive of the confusion which one encounters in the synonymy of this holly than the term "Augean stable."

There has long been a need for a thorough discussion of the correct name of the yaupon, the source of the black-drink once so commonly used as a ceremonial emetic and stimulant amongst Indians of the southeastern part of the United States.

The monographer of the *Aquifoliaceae*, Loesener (Monogr. Aquifol. in Nova Acta Acad. C. L. C. G. Nat. Cur. 78 (1901)) employed the binomial *Ilex caroliniana* (Lam.) Loes. Most modern taxonomic treatments, however, use *Ilex vomitoria* [Soland. in] Ait.

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[1] Botanist, Bureau of Plant Industry, Soils, and Agricultural Engineering, Agricultural Research Administration, United States Department of Agriculture; Research Fellow, Botanical Museum, Harvard University. This contribution is part of a study of New World narcotic and stimulant plants carried out as a Guggenheim Fellow in Botany.

Notwithstanding this tendency in botanical works, a most baffling confusion and uncertainty still exists throughout the numerous chemical, pharmacological, anthropological and ethnobotanical publications and hampers understanding and accuracy. In view of the lack of any adequate review of the taxonomic and nomenclatorial history of this plant since 1753, it has seemed advisable to present the following notes in an attempt to set forth the reason why the correct, though not the earliest, name is *Ilex vomitoria* and to discuss the origin, status and significance of the synonymy of this binomial.

Ilex vomitoria [*Solander* in] Aiton Hort. Kew. [ed. 1] 1 (1789) 170.

I. Cassine β Linnaeus Sp. Pl. 1 (1753) 125.

Cassine Paragua Miller Gard. Dict. [ed. 8] (1768) Cassine no. 2. Non *Cassine Peragua* Linnaeus Sp. Pl. [ed. 2] (1762) 384. Non *Cassine Peragua* Linnaeus Mant. 2 (1771) 220.

C. caroliniana Lamarck Dict. 1 (1783) 652, *pro parte*,

I. Cassine Walter Fl. Carol. (1788) 241.

I. ligustrina Jacquin Collect. 4 (1790) 105; Icon. Rar. 2 (1793) 9, t. 310.

Casine yapon Bartram Travels (1791) 259, *nom. nud.*

I. floridana Lamarck Ill. 1 (1791) 356.

I. Cassena Michaux Fl. 2 (1803) 229.

I. religiosa Barton Fl. Virg. (1812) 66.

? Cassine ramulosa Rafinesque in Robin Fl. Lud. (1817) 110.

Hierophyllus Cassine (Walt.) Rafinesque Med. Bot. 2 (1830) 8.

? Cassine amulosa Rafinesque Med. Fl. 2 (1830) 205, *nom. sphalm.*

Ageria Cassena (Michx.) Rafinesque Sylv. Tellur. (1838) 47.

? *Emetila ramulosa* Rafinesque in S. Watson Bibl. Ind. N. Am. Bot. (1878) 158, *nom. in syn.*

Cassine yaupon Gatschet in Trans. St. Louis Acad. Sci. 5 (1888) 88, *nom. nud.*

I. Peragua (L.) Trelease in Trans. Acad. Sci. St. Louis 5 (1889) 346, *in obs.*

I. caroliniana (Lam.) Loesener in Bot. Centralbl. 47 (1891) 163.

I. vomitoria [Soland. in] Aiton var. *Yawkeyii* Tarbox Some Nat. Hollies in Brookgreen Gardens (1944) 19, *sine diagn. lat.*

Cassine vomitoria Swanton in Bull. Bur. Am. Ethnol. 137 (1946) 284, *nom. nud.*

Perhaps the earliest widespread reference to the yaupon in a botanical publication was made by Bauhin and Cherler in their encyclopaedic "Historia plantarum universalis" 3 (1651) 631. No description of the plant was given. The title, "Herba Cassiana, famen sitimque retardans," of the brief discussion, which reported the use of the infusion of the leaves as a stimulant, referred to the hunger-allaying properties of the shrub. This reference is an elaboration of an earlier report by Bauhin (Pinax (1623) 170), based upon what appears to be the first account of the black-drink (Nuñez Cabeça de Vaca "Relación y comentarios. . . ." (1542) cap. 26), herein reproduced (Plate XXIV).

Later, Leonard Plukenet described the species as *Cassine vera Floridanorum Arbuscula baccifera Alternati ferme facie, foliis alternatim sitis, tetrapyrene* ("Opera omnia botanica" 3 (1691) 40) and published what is apparently the earliest illustration (loc. cit. 4 (1692) t. 376, f. 2). No mention seems to have been made of the use of the plant.

It is to Mark Catesby ("The natural history of Carolina, Florida and the Bahama Islands" 2 (1754) 57) that we are indebted for the first definite and convincing identification of the source of the black-drink which, for 235 years previously, had been attracting the attention of travellers. This was accomplished through Catesby's charming plate and his description of Plukenet's *Cassine vera Floridanorum Arbuscula baccifera Alternati ferme facie, foliis alternatim sitis, tetrapyrene*, together with a very lengthy account of the properties and ceremonial uses of the plant.

The earliest tenable post-Linnaean name for the yaupon is found in volume one of the first edition of Aiton's "Hortus Kewensis" (1789). It was here named *Ilex vomitoria.* The specific epithet would indicate that Solander, who described the plant, was familiar with its renown as an emetic, although he made no mention of this in his notes. The original description is short: "I. foliis alternis distantibus oblongis obtusiusculis crenato-serratis: serraturis muticis."

It will be noted that Miller's *Cassine Paragua*, (1768) referring, without any doubt, to the concept now under consideration, antedates *Ilex vomitoria.* We must investigate the reasons for the untenability of Miller's binomial, because of the almost unbelievable confusion of his specific epithet and Linnaeus' several concepts—all named *Cassine Peragua* or the orthographic variant *C. Paragua.* Notwithstanding the unavailability of the epithet *Peragua*, the combination under *Ilex* has been made. We must realize, however, that the author did not urge its acceptance. Trelease, although he accepted *Ilex Cassine* Walt. as the correct name for the yaupon holly, wrote in a footnote (in Trans. Acad. Sci. St. Louis 5 (1889) 346, *in obs.*): "An effort to improve on the nomenclature of this species, unless it is called *I. Cassine* β L. Sp. (1753) 125, would probably cause it to stand as *I. Peragua* (L.)=*Cassine Peragua* L. Mantiss. (1771), ii, 200."

In 1762, Linnaeus (Sp. Pl. [ed. 2] 1 (1762) 384) published *Cassine Peragua* for an Old World concept. He cited several sources which indicate that the concept was unquestionably an Old World one. Although one of these sources (Hortus Cliffortianus (1737) 72) attributed the plant both to the Cape of Good Hope *and* to Carolina, it is clear that it was not being confused with the concept now known as *Ilex vomitoria* which was discussed separately (loc. cit. 40) and was attributed to "Carolina *Americae.*"

Cassine Peragua was published again by Linnaeus nine years later (Mant. 2 (1771) 220). In this second Linnaean publication, it referred not to the Old World concept of the earlier (1762) *Cassine Peragua* but to several different concepts.

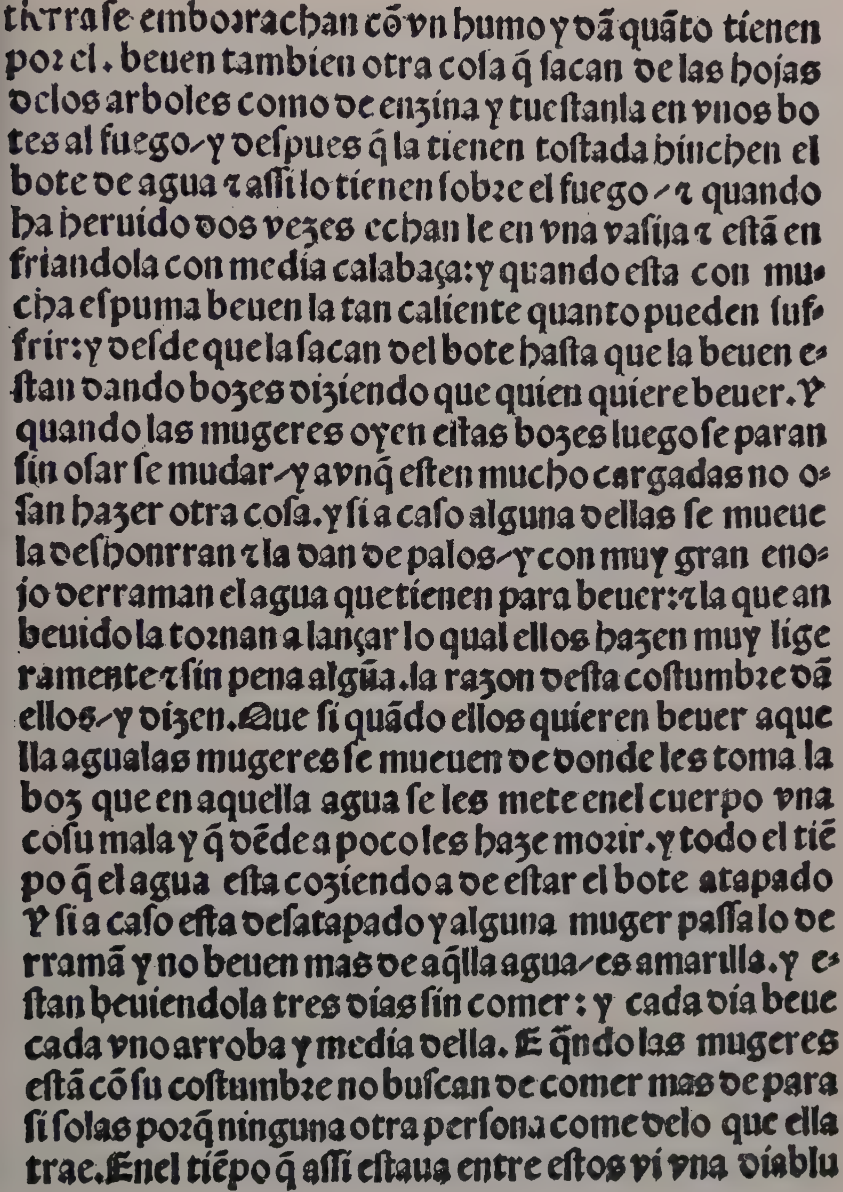
Linnaeus' *Cassine Peragua* of 1771 has hitherto been considered by some taxonomists as a synonym of *Ilex vomitoria*, either wholly or in part. There has been much uncertainty as to the exact meaning of this name, because, in the Linnaean Herbarium, there are two distinct American plants under the binomial. Loesener (in Engler Bot. Jahrb. 28, 2 (1900) 154–155) considered *Cassine Peragua* L. of 1771 as a *nomen nudum.* Fernald and Schubert (in Rhodora 50 (1948) 169) hold it to be a *nomen ambiguum* and a *nomen confusum* and suggest that it be permanently rejected. Photographs of the two specimens indicate that neither is referable to *Ilex vomitoria;* both are species of *Viburnum* (Fernald and Schubert loc. cit.). Therefore, whether *Cassine Peragua* L. of 1771 be rejected or not, there is no need of considering further the name in any discussion of the synonymy of *Ilex vomitoria.* Trelease's combination, *Ilex Peragua* is untenable since it is based on a homonym.

Cassine Paragua Miller (Gard. Dict. [ed. 8] (1768) *Cassine* No. 2), on the contrary, is very definitely referable to

EXPLANATION OF THE ILLUSTRATION

Plate XXIV. The earliest European account of the use of the black-drink was written by Nuñez Cabeça de Vaca and published in his "Relación y commentarios. . . ." of which there have been several editions. The illustration is a photograph of the account as it appears in the first edition of 1542. Of this rare and fascinating book only two copies are known: an imperfect copy preserved in the British Museum; and a perfect one in the New York Public Library, through the kind cooperation of which institution the photograph herein reproduced was made available.

Plate XXIV

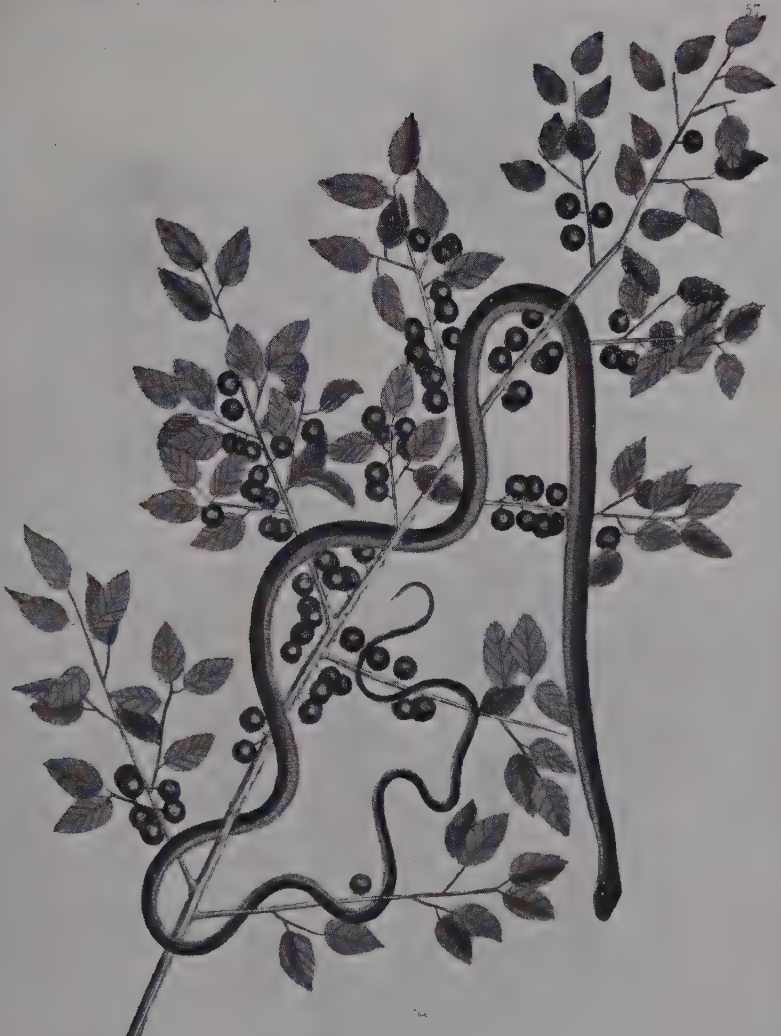


tierra ſe emboꝛrachan cõ vn humo y dã quãto tienen poꝛ el. beuen tambien otra coſa q̃ ſacan de las hojas delos arboles como de enzina y tueſtanla en vnos botes al fuego/ y deſpues q̃ la tienen toſtada hinchen el bote de agua ⁊ aſſi lo tienen ſobꝛe el fuego/ ⁊ quando ha heruido dos vezes echan le en vna vaſija ⁊ eſtã enfriandola con media calabaça: y quando eſta con mucha eſpuma beuen la tan caliente quanto pueden ſufrir: y deſde que la ſacan del bote haſta que la beuen eſtan dando bozes diziendo que quien quiere beuer. Y quando las mugeres oyen eſtas bozes luego ſe paran ſin oſar ſe mudar/ y avnq̃ eſten mucho cargadas no oſan hazer otra coſa. y ſi a caſo alguna dellas ſe mueue la deſhonrran ⁊ la dan de palos/ y con muy gran enojo derraman el agua que tienen para beuer: ⁊ la que an beuido la toꝛnan a lançar lo qual ellos hazen muy ligeramente ⁊ ſin pena algũa. la razon deſta coſtumbꝛe dã ellos/ y dizen. Que ſi quãdo ellos quieren beuer aquella agua las mugeres ſe mueuen de donde les toma la boz que en aquella agua ſe les mete enel cuerpo vna coſu mala y q̃ dẽde a poco les haze moꝛir. y todo el tiẽpo q̃ el agua eſta coziendo a de eſtar el bote atapado Y ſi a caſo eſta deſatapado y alguna muger paſſa lo derramã y no beuen mas de aq̃lla agua/ es amarilla. y eſtan beuiendola tres dias ſin comer: y cada dia beue cada vno arroba y media della. E q̃ndo las mugeres eſtã cõ ſu coſtumbꝛe no buſcan de comer mas de para ſi ſolas poꝛq̃ ninguna otra perſona come delo que ella trae. Enel tiẽpo q̃ aſſi eſtaua entre eſtos vi vna diablu

EXPLANATION OF THE ILLUSTRATION

Plate XXV. The plant which was the source of the black-drink was definitely identified in 1754 by Mark Catesby, as evidenced by this beautiful illustration from his "The natural history of Carolina, Florida and the Bahama Islands" 2 (1754) 57.

PLATE XXV


57
Anguis &c.
Cassena &c.

EXPLANATION OF THE ILLUSTRATION

Plate XXVI. The discussion of the black-drink accompanying Catesby's plate.

PLATE XXVI

Caſſena vera Floridanorum, Arbuſcula baccifera Alaterni facie, foliis alternatim ſitis, tetrapyrene. Pluk. Mant.

THIS Shrub uſually riſes from the ground with ſeveral ſtems, to the height of twelve feet, ſhooting into many upright, ſlender, ſtiff branches, covered with whitiſh ſmooth bark, ſet alternately with ſmall evergreen ſerrated leaves, reſembling thoſe of *Alaternus*. Its flowers are ſmall, white, and grow promiſcuouſly amongſt the leaves, and are ſucceeded by ſmall ſpherical berries on ſhort footſtalks: theſe berries turn red in *October*, and remain ſo all the winter, which, with the green leaves and white bark, make an elegant appearance. But the great eſteem and uſe the *American Indians* have for it, gives it a greater character. They ſay, that, from the earlieſt times, the virtues of this Shrub has been known, and in uſe among them, prepared in the manner they now do it, which is after having dried, or rather parched the leaves in a porrage-pot over a ſlow fire, they keep it for uſe: of this they prepare their beloved liquor, making a ſtrong decoction of it, which they drink in large quantities, as well for their health as with great guſt and pleaſure, without any ſugar or other mixture; yet they drink and diſgorge it with eaſe, repeating it very often, and ſwallowing many quarts. They have an annual cuſtom in the ſpring of drinking it with ceremony; the town having notice from the King or principal, the inhabitants aſſemble at the Town-houſe, having previouſly by fire purged their houſes of all their old furniture, and ſupplied them with new, the King is firſt ſerved with a bowl or conch-ſhell, never uſed before, of this emetick broth, by the next to him in eminence, and he by the next is ſerved; and ſo on, till he comes to the women and children. They ſay it reſtores loſt appetite, ſtrengthens the ſtomach, giving them agility and courage in war, *&c.* It grows chiefly in the maritime parts of the country; from whence thoſe *Indians* ſupply the *Mountain-Indians* with it; carrying on the like trade with it in *Florida*, as the *Spaniards* do with the South-ſea tea from *Paraguay* to *Buenos-ayres*; *Florida* being in the ſame latitude north, as *Paraguay* is ſouth: and obſerving, by comparing the leaves of both, no apparent difference in them, induces me to believe they are both the ſame Plant. In *South-Carolina* it is called *Caſſena.* In *Virginia* and *North-Carolina* it is known by the name of *Yapon*; in the latter of which places it is as much in uſe among the white people as among the *Indians*, at leaſt among thoſe who inhabit the ſea-coaſts.

*CET Arbriſſeau s'éleve ordinairement à la hauteur de douze piés, avec pluſieurs tiges, qui ſe diviſent en pluſieurs branches menues, roides, couvertes d'une écorce liſſe & blanchâtre, & garnies de petites feuilles dentelées, toujours vertes, rangées alternativement, & ſemblables à celles de l'*alaterne. *Ses fleurs ſont petites, blanches, & viennent çà & là parmi les feuilles. Il leur ſuccede de petites bayes ſphériques, attachées à des pédicules courts: ces bayes deviennent rouges au mois d'*Octobre, *& demeurent en cet état tout l'Hiver, ce qui, joint au verd des feuilles & à la blancheur de l'écorce, produit un effet très agréable; mais le mérite de cet Arbriſſeau eſt encore plus relevé par l'eſtime que les* Américains *ont pour lui, & l'uſage qu'ils en font: ils diſent que ſes vertus ont été connues parmi eux depuis les prémiers temps, & qu'ils s'en ſont ſervis en le préparant de la même maniere qu'ils le font aujourd'hui: ce qui ſe fait en ſéchant, ou plutôt en grillant ſur un petit feu dans un pot les feuilles que l'on veut garder: ils font de ces feuilles une forte décoction, qui eſt leur breuvage favori, dont ils boivent une grande quantité autant par plaiſir & par goût, que pour leur ſanté: ils n'y mêlent ni ſucre ni autre choſe; & ils en avalent pluſieurs pintes, qu'ils vomiſſent avec la même facilité, ce qu'ils repetent ſouvent. Ils ont une coûtume annuelle au* Printemps *de boire cette liqueur en cérémonie: la ville étant avertie par le* Roi *ou le Chef, les habitans s'aſſemblent à la maiſon de ville, après avoir purgé leurs maiſons de tous leurs vieux meubles, & les avoir garnies de nouveaux utenſiles: le* Roi *reçoit le prémier dans un vaiſſeau ou une coquille, qui n'a jamais ſervi, cette liqueur émétique des mains du plus qualifié après lui: celui là eſt ſervi par un autre; & on va ainſi de ſuite juſqu'aux femmes & aux enfans. Ils diſent que ce bouillon retablît l'appetit, fortifie l'eſtomac, & leur donne de l'agilité & du courage à la guerre,* &c. *Il croît le plus communément dans les endroits du pays qui ſont vers la Mer; & les Indiens, qui les habitent, en fourniſſent à ceux des Montagnes: ils en font le même commerce à la* Floride, *que les Eſpagnols font du thé de la Mer du Sud, depuis le* Paraguai *juſqu'à* Buenos-Ayres. *La* Floride *étant dans la même latitude au Nord, que le* Paraguai *eſt au Sud, & ne trouvant aucune différence entre les feuilles de l'un & de l'autre, je ſuis porté à croire que c'eſt la même Plante. On la nomme au Sud de la* Caroline Caſſena: *à la* Virginie, *& au Nord de la* Caroline *elle eſt connue ſous le nom d'*Yapon; *& dans le dernier de ces endroits elle eſt autant en uſage parmi les* Blancs *que parmi les habitans, du moins ceux qui demeurent ſur la côte.*

Ilex vomitoria and, as such, must be taken into account.

At first glance, it would seem that *Cassine Paragua* Mill. might properly be the basis of a new combination under *Ilex.* Closer examination will reveal, however, that its status is that of a homonym with an orthographic variation and is, therefore, unavailable.

In the 9th edition of Miller's "Gardener's Dictionary" (1797) *Cassine* No. 2, the orthography is altered from *Cassine Paragua* to conform with Linnaeus' *C. Peragua.* Thomas Martyn, editor of the work, reported under *Cassine* No. 2, that: "*Cassine Paragua* of Miller is *Ilex vomitoria. C. Peragua* of the Mantissa, is *Viburnum laevigatum.*" Martyn, having corrected Miller's orthographic error, united two names for the Old World concept correctly under the older name *Cassine Peragua.* But he then proceeded to misapply this name to the New World concept which we now know as *Ilex vomitoria* which is "native of Virginia and Carolina." In consideration of these circumstances, then, Miller's specific epithet *Paragua* cannot be available for transfer to *Ilex.*

The confused use of the name *Ilex Cassine,* which has likewise hampered our understanding of *Ilex vomitoria,* is attributable to the unfortunate fact that this binomial has been published by two authors for different concepts.

The earlier *Ilex Cassine* Linnaeus (Sp. Pl. (1753) 125) was an unfortunately chosen name, for while the binomial itself refers without any doubt to the dahoon of the southeastern United States, the specific epithet was taken from one of the common names of the yaupon holly and applied to the other holly by Linnaeus in error. *Ilex Cassine* L., therefore, is the accepted technical name for the dahoon holly.

A few years later, Walter (Fl. Carol. (1788) 241) published *Ilex Cassine* to refer to the concept we now call *I. vomitoria,* as ascertained by reference to a photograph of the type specimen (Schubert [photographer]: "The Herbarium of Thomas Walter at the British Museum (Natural History), South Kensington, London, England," (1946–7) *Ilex Cassine* [a bound volume of photographs in the Gray Herbarium]). Although Walter's specific epithet is correctly applied to the plant which is widely known by that common name, and although it antedates *Ilex vomitoria* by one year, the name falls because it is a homonym.

This dual use of the same binomial has, as Loesener (in Bot. Centralbl. 47 (1891) 161–163) pointed out, led to confusion, although even a rapid examination of the case would have made clear all points of uncertainty. E. M. Hale's very excellent historical treatment of the black-drink plant ("*Ilex Cassine*, the aboriginal North American tea": Bull. No. 14, U.S.D.A. Div. Bot. (1891)), for example, suffers from his use of the name *Ilex Cassine* without even one reference to indicate whether the binomial of Linnaeus or that of Walter is being accepted; Hartwich's monumental work on narcotic plants ("Die Menschlichen Genussmittel" (1911) 468) uses *Ilex Cassine* L.; and Wehmer ("Die Pflanzenstoffe" (1911) 456; [ed. 2] 2 (1931) 718) accepts *I. Cassine* Walt. The first chemical report (Smith, H. M.: in Am. Journ. Pharm. 44 (1872) 216) of the discovery of caffeine in a North American *Ilex* is of doubtful value partly because of an uncertainty as to which *Ilex Cassine* was being examined. In 1883, still another report of a chemical analysis (Venable, F. R.: in Chem. News 52 (1885) 172) employed the name *Ilex Cassine* without author citation, thus leaving room for uncertainty as to the exact species which was analysed. An even more interesting result of the confusion of the *Ilex Cassine* of Linnaeus with that of Walter is found in a standard pharmacological work (Tschirch, A.: "Handbuch der Pharmacognosie" 3, Abt. 1 (1923) 432), in which its writer "affirms and denies the existence of caffeine in *Ilex Cassine* all in the same paragraph" (Maxwell, M. M.: "*Ilex Cassine* L. . . . " ms. report (no date) in Libr. Econ. Bot. Harvard Univ.).

Loesener (in Bot. Centralbl. 47 (1891) 163) rejects *Ilex vomitoria* in favor of *Ilex caroliniana* (Lam.) Loes., a combination which he made on the basis of Lamarck's *Cassine caroliniana*. This procedure is not permissible. Lamarck's binomial *Cassine caroliniana* (1783) is not available, since it is a substitute for the validly published *Cassine corymbosa* Miller (Dict., [ed. 8] (1768) *Cassine* No. 1; Icones (1760) 83, t. 1). It might be pointed out in passing that Miller's *Cassine corymbosa* does not refer to the concept *Ilex vomitoria*.

The other synonyms of *Ilex vomitoria* have not, for the most part, entered into the chemical, pharmacological and anthropological literature. They are included in the foregoing enumeration for the sake of completeness. Several of the Rafinesque names are referred to *Ilex vomitoria* with some reserve. They are not based on specimens which might be examined, and the descriptions are brief and vague in the extreme. It is fortunate that they do not need to be considered nomenclatorially in determining the correct name of the yaupon, but, being later, can be relegated immediately to synonymy.

A NEW VARIETY OF ILEX VOMITORIA FROM SOUTHERN MEXICO[1]

BY

A. J. Sharp

Ilex vomitoria [*Soland.* in] *Aiton* var. **chiapensis** *A. J. Sharp var. nov.*

Haec variatas ab *Ilice vomitoria* principaliter foliis pubescentibus et ramulorum villis longioribus differt.

From the species, this new variety differs primarily in having loosely pubescent leaves and longer (about twice as long) hairs on the branchlets. There is a tendency for the leaves to be a little more ovate and obtuse at the apices, although many leaves match in shape those from North American material of the species. The material of *Ilex vomitoria* in the Gray Herbarium (all from southeastern United States) has been examined, and the leaves are glabrous, except for occasional puberulence on the mid-rib at the base.

This report adds another species to the growing list of plants which occur both in central or southern Mexico and in southeastern United States. In Mexico, their ranges are disjunct from their areas in the United States, and the largest number of such species seems to be found in the highlands toward the Gulf of Mexico. A fuller discussion of the phytogeographical problem basic to this interrupted distribution will be presented later.

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[1] Contribution from the Botanical Laboratory, The University of Tennessee, N.S. 118.

Mexico: Estado de Chiapas, south side of Río Tzaconeja near San Gregorio. Alt. 6500 ft. November 20, 1945, *Aaron J. Sharp & Efraín Hernández Xolocotzi 45989*. (Type in Herb. Gray; Duplicate types in Herb. Univ. Tenn., Herb. Inst. Biol. (México)).—Estado de Chiapas, near Lake Jusnajav, about 16 km. northeast of Comitán. Alt. 5500 ft. April 29, 1945, *Aaron J. Sharp & Edward J. Alexander 45444*. —Estado de Chiapas, moist slope below Morelia, toward Río Tzaconeja, on the trail to San Carlos. Alt. 4600 ft. April 10, 1946, *Efraín Hernández Xolocotzi & Aaron J. Sharp 46249*.